

Remarks

The non-final Office Action mailed August 1, 2008, has been carefully considered. Claims 2-16 and 19-22 are pending in this application, but, claims 2, 3, 13 and 14 having been withdrawn from consideration, claims 4-12, 15, 16 and 19-22 have been examined. Claims 4-12, 15, 16 and 19-22 stand rejected. Claims 4, 6, 11, 12, 15, 19 and 20 have been significantly amended to more clearly discuss the steps of a recited recipe or the structural features of a recited controller or both. The limitations of claim 8 have been substantially incorporated into claim 4 and claim 8 cancelled.

Moreover, the claims have been clarified to utilize one standard of measuring vacuum pressure, that is, in Torr values, where 0 Torr represents a perfect vacuum and 760 Torr, one atmosphere, rather than using kPa in some claims and Torr in others. Applicants have also used commas in recommended places to make the claims more readable.

In her DETAILED ACTION, at paragraph 2., the Examiner notes that claim 16, having been amended, should have been properly identified as 'Currently Amended' in stead of 'Original' and clarified the issue with the undersigned by telephone on May 14, 2008. Claim 16 has not been further amended and is now identified as 'Previously Presented.'

At paragraph 3., the Examiner suggests that claims 12 and 15 may be made easier to read by adding commas. As indicated above, such commas have been added to these claims.

Claim Rejections – 35 USC Section 112, second paragraph

Claims 4 and 11 are rejected under 35 USC 112, second paragraph, as indefinite. In particular, the Examiner finds "normal pressure" indefinite and the Examiner will equate "normal pressure" with vacuum pressure. To the extent that the Examiner is unable to find normal pressure defined, the Examiner is referred to, for example, Figure 2 and page 13, lines 4-8, where ammonia-purging is described at 20 Torr. Then, beginning at line 26, gas is "stabled" (stabilized) at predetermined pressure and temperature, beginning at line 4, stabling step, the gas is brought to "normal" pressure. So, normal pressure, referred to herein as a first predetermined pressure, is used for loading, unloading, and stabilizing at various points in Figures 2 and 2.

Referring to Figure 2, after unloading, loading and stabilizing, the gas is discharged beginning at page 15, line 28, to a high vacuum pressure of .2 Torr and a temperature of 760° C. Again, for unloading, the temperature is brought down to 300° C and “normal” pressure, the first predetermined pressure. Consequently, it may be concluded that normal pressure is typically a first predetermined pressure for loading, unloading and stabilizing.

Referring to Figures 2 and 3, each a film-forming embodiment, and reading from left to right, pressures are given as “normal,” 2660 (20 Torr), “normal,” 26.5 (.2 Torr) and “normal” for Figure 2. For Figure 3, as read from left to right, the vacuum pressures are “normal,” 26.5 (.2 Torr), “normal,” 20000 (150 Torr), 2660 (20 Torr) and “normal.” Again, each of these vacuum pressures or first predetermined pressure (normal) is controlled by a controller 21, that “measures temperatures and pressures at a plurality of positions of the thermal processing unit 1, respectively.” Moreover, the controller 21 is connected to the boat elevator 8 (for loading and unloading), the heater 12, the processing-gas introducing tube 15, the cleaning-gas introducing tube 15, the purge-gas supplying tube, the valve 19 and the vacuum pump 20.

As an overview of the present independent claims, it is respectfully submitted that independent claim 4, because of its reference to fluorine for nitride deposit removal and purging with nitrogen-including gas, is supported, for example, by Figure 3, cleaning and purging.

Claim 11 has been written in independent form and so further includes a film-forming process of Figure 3.

It is respectfully submitted that claim 12 may read on either of the film-forming processes of Figures 2 or 3. Independent claim 15, for example, reads on Figure 3, film-forming and cleaning.

Regarding the dependent claims, claim 6/4 has been amended to define the nitride-removing step as at approximately 150 Torr and 300° C and is supported by cleaning in cleaning process (Figure 3).

Claim 6/4 has been amended to introduce pressures and temperatures and a controller.

Claim 7/4 has been amended to define the purging step as at approximately 900° C activation as supported by Figure 3 ammonia purging and to introduce a controller.

Claim 19 dependent on either claim 12 or 15 has been amended to recite “responsive to the controller.”

Claim 20 which likewise depends from claim 12 or 15 has been amended to recite the controller and a vacuum pressure inside of the reaction chamber between .2 Torr and 400 Torr.

Claim Rejections – 35 USC Section 102

Claims 12 and 15 stand rejected as anticipated by Ishibashi (US 6,942,892). Each of these independent claims has been amended to recite, *inter alia*, a controller, connected to said heating unit and to said nitrogen-including-gas supply unit, for measuring temperature and pressure at a plurality of positions of said film-forming unit. The Examiner finds Ishibashi has a “controlling unit” but must look to a plurality of different means: flow controller, electric current and exhaust system. As recited, a controller is “connected to said heating unit and to said nitrogen-including gas supply unit, for measuring temperature and pressure at a plurality of positions of said film-forming unit.” Thus, the recipe is followed by the controller with structural distinctions recited which distinguish over Ishibashi. Moreover, Ishibashi provides a suggestion to heat the chamber above 200° C at column 2, line 48, for cleaning, and at column 6 suggests between 400° and 1000° C. At column 7, line 28-30, “the higher the temperature of these objects, the larger the reaction rate of the cleaning gas with the deposited films.” On the other hand, there is no recipe and no specific pressure recited anywhere in Ishibashi. Consequently, it is respectfully requested that the anticipation rejections of claims 12 and 15 be withdrawn.

Claim Rejections – 35 USC Section 103

Claims 4-11 and 21-22 stand rejected under 35 USC 103(a) as being unpatentable over Bolscher et al. (US 6,468,903), hereinafter, Bolscher, in view of Goto et al. (US 2003/0010354), hereinafter, Goto, and Yoo (US 2002/0102/0102859).

Bolscher, in particular, discusses a pretreatment 20 after a cleaning procedure 10 where the cleaning “is not essential for the present invention” using typical wet chemical procedures. Pretreatment 20 involves: “a nitrogen source gas under conditions that lead to a nitridation of the

reactor part” – “parts are heated, preferably to at least about 800° C and more preferably to at least about 850° C. As an example, the following conditions could be used for the pretreatment 20: a flow of 500 sccm NH₃ at a pressure of .5 Torr (66 Pa) during 30 minutes at 850° C. Then, there may be cleaning 10 again using the wet chemical procedures. Aside from this reference to temperature and vacuum pressure, there is no recipe as recited. There is no controller as recited, for example, in claim 11.

In re Aller, 105 USPQ 233, is cited for the proposition that a given pressure range involves only routine skill in the art. The claims as amended involve complicated changes of both temperature and pressure according to a recipe and, according to most claims, involving a controller “connected to said heating unit and to said nitrogen-including gas supply unit, for measuring temperature and pressure at a plurality of positions of said film-forming unit.” In this manner, a recipe is followed and controlled.

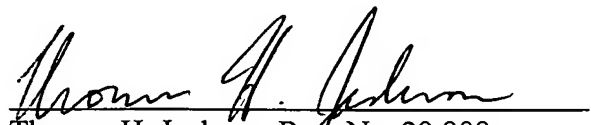
Claims 16 and 19-20 stand rejected as unpatentable over Ishibishi as applied to claims 12 and 15. *Ex parte Masham* is cited for the principle that structural limitations are more important than, for example, a choice of nitrogen-including gas. Again, it is respectfully urged that Ishibish’s failure to provide a controller as recited patentably distinguishes these claims over the applied reference.

In view of the above, early and favorable action is respectfully requested. The Examiner has been contacted about discussing the present amendment at an examiner interview in an effort to reach agreement on a scope of patentable subject matter.

The Office is authorized to charge any fees required in connection with this filing to
Deposit Account No. 02-4300, Order No. 033082M274.

Respectfully submitted,
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Dated: November 3, 2008